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WORK UNIT DETERMINATION
FOR STAFFING REQUIREMENTS IN OCCUPATIONAL THERAPY
WITHIN ARMY MEDICAL FACILITIES

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A Problem Solving Project
Submitted to the Faculty of
Baylor University
In Partial Fulfillment of the
Requirements for the Degree
of
Master of Health Administration

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By

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<p>As an indicator of manpower productivity in Occupational Therapy clinics at Army MTFs, the "clinic visit" has been used. However, in recent years, evaluation techniques in the field have grown more sophisticated, requiring more equipment, additional training, and higher skills. Treatments have been expanded to include disabilities which had not been previously identified or could not be helped. JCAH requirements for specific documentation in medical records, chart audits, peer review, and the need for additional records and reports have all impacted on the occupational therapist's time. Thus the feeling that manpower allocation based on the clinic visit is inappropriate. This study finds that, mathematically, the clinic visit is an acceptable measure, but not the most ideal one. A formula which considers a variety of factors is recommended.</p>					
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I. INTRODUCTION

Manpower has always been a critical resource in health care. There are usually more patients needing care than there are health practitioners who can provide the services. The military health care system has not been exempt. ^{from what?} Lower ceilings being placed on military manpower by Congress are having an effect throughout the Medical Department. Because of this ^{what increase?} increase in demand and continuing manpower restrictions, it becomes imperative that manpower ^{is} allocated in an appropriate manner to place resources where they will be most beneficial.

Occupational Therapy Workload

Occupational Therapy in the Army has experienced ^{personnel} reductions along with everyone else. During the same ^{what period?} period, however, the practice of Occupational Therapy has changed. Evaluation techniques have grown more sophisticated and varied, requiring more equipment, additional training and higher skill levels. Treatment techniques have expanded to include disabilities which had not been previously identified or could not be helped, such as children with developmental delays or learning disabilities. Through technological improvements in medical care, patients who previously did not survive, such as patients with high level spinal cord injuries or the severely burned, now require considerable assistance from all members of the rehabilitation team. ^{is it a team?}

In addition to the changing treatment techniques, the environment, in the form of regulatory agencies, imposes additional demands. The JCAH

requirements for specific forms of documentation in the Clinical Record has resulted in a minimum of one hour per day per therapist being spent on this task. The additional requirements of peer review, chart audit, records and reports, and other administrative functions require an average 29% of staff time.¹

In spite of the changes in therapeutic procedures, the Army still allocates manpower based on the historical data of the clinic visit. The clinic visit does not allow for any variations in length of treatment, giving credit for one visit whether the treatment takes one hour to evaluate a patient's functional abilities or ten minutes to screen for problems. Neither does it recognize the variation in skill level of the therapist, when different levels of care are provided.

Occupational Therapists have long felt that the current manpower allocation based on the clinic visit inadequately reflects the varied patient treatments that therapists perform and therefore the productivity of the manpower. In order to maintain manpower authorizations at present strengths, therapists must "play the game" of keeping up the count. It is felt that a more appropriate weighted value could be developed which would allocate manpower based on the complexity of care given instead of a meaningless number. Such a weighted value would more accurately measure the productivity of a section. It would also encourage treatment to be provided based on the needs of the patient and not on the needs of the clinic count.

*Is the Problem primarily measurement
or manpower resource allocation?*

Statement of the Problem

The problem was to determine an appropriate work unit measure to be used as a yardstick for manpower staffing requirements of non-clerical personnel in Occupational Therapy Clinics within Army medical treatment facilities.

Limitations

This study is limited to a review of literature to identify workload determination methods and analysis of data that can be gathered through the use of a mailed survey. Analysis of data is focused on identifying some combination of factors which would be a better indicator of manpower productivity than the present clinic visit.

This study has a number of obstacles which should be recognized. One is the type of data that can be gathered through the use of the survey format. Requiring more than a hundred people to maintain an additional record for data collection places a limit on the detail that can be requested. The second obstacle is in the varied interpretation of instructions that can occur when so many individuals are asked to contribute data to such a study. The accuracy and validity of the data, therefore, depends upon the respondent's understanding of what is being asked. *And upon the verbal skills of the person asking.*

A further factor which may have an influence on this study is the existing attitude among Occupational Therapy personnel that the present clinic visit is not a "fair" reflection of the work they do. The traditional need to "keep up the count" and the present confusion of what can be counted as a clinic visit could influence the data collection process for this study.

Review of the Literature

Productivity

The basic question in the manpower allocation problem is one of productivity, defined in its most basic form as "output per unit of input." How much output, however defined, are we getting for a certain quantity of inputs, in this case, manhours of treatment time. Unfortunately, it is the output that is difficult to identify and quantify. In the area of health services, the output is viewed "as the end result of combining various quantities of health manpower, capital and other medical inputs in accordance with some set of technological relations."² The basic production function formula of $Q_t = f(X_{1t}, X_{2t}, \dots, X_{nt})$ serves to describe the relationship where Q is the output and X represents the various inputs or factors of production. *The difference between single factor & total factor productivity.*

Although the production function considers many factors in the output equation, not all of them need to be addressed at one time. Theoretically, the productivity of one factor can be isolated and measured, but one must recognize that other factors contribute to that output.³ It would be possible to study the output generated by a certain number of manhours of input, although other factors such as supplies, physical space and equipment ^{do} ~~may~~ also influence the output. The definition of output, however, is necessary before productivity can be measured.

Productivity in Health Care

This problem of what is being produced within the health care industry has been addressed in the literature by a number of authors. In looking at improving productivity of human service organizations, McLaughlin deals

with the problem by separating the outputs based on the constituent of the service.⁴ For example, the payor of health care is judging by a different set of criteria than the client, who is often as concerned with the process of care as he is with the outcome of care. Because of this varied constituency, goals are set at a highly abstract level, such as "providing quality care." Although such vague goals may at times be necessary for political expediency, they present difficulties when resources are allocated. Feeling a need for more concrete data, the manager develops a proxy or substitute which quantifies the output. Unfortunately this can create a false view of the task at hand. Beds occupied as a proxy for the amount of health care provided presents one such off-center view of the task at hand.

In addressing productivity trends by hospital department, Cromwell found similar difficulties in identifying the product.⁵ One problem in using the patient day as the output measure is that it is not a quality-constant definition of output. The patient day of today is of a far different quality than one in the past and is, therefore, a different product. The alternative chosen for his study was to look at a group of selected hospital services where quality changes have been minor. Among the measures used were meals served for Dietary; beds occupied for Medical Records and Nursing; procedures performed for Radiology; tests performed for Laboratory; and number of visits for Operating Rooms. By such selective measurement, however, only a portion of the hospitals' output can be addressed and increases in quality remain unmeasured.

Bailey⁶ argues that the traditional economists' view of medical care having one measurable product is not valid. The traditional production function implies that the patient visit or some similar unit is the sole output of the physician's office with various units of labor and capital as the inputs. This view neglects the fact that medical care is a multi-product operation which produces a variety of services such as an examination, a laboratory test, an X-ray, all of which have separate and distinct inputs. Only by applying this multi-product view can one understand and explain changes in medical care which result from group practice and specialization. This view can also provide a more valid explanation of apparent increases in productivity.

Finding the patient visit an equally unsatisfactory measure of physician productivity, Daniels brings in the question of quality. "Discussions of physician productivity must confront the complicated concern about whether increased quantity must lead to decreased quality and both of their relationships to cost."⁷ This supports the above mentioned concern of how much a change in the quality of the service provided is in fact a different product. A similar question arises when one looks at transfer of functions from the highly skilled professional to the paraprofessional.

Although the one-dimensional index of output such as the clinic visit or the patient day is not ideal, neither is it completely useless. According to Reinhardt,⁸ such an index, if collected over a sufficient length of time can be a reasonably close indication of the volume of services provided. Variations in types and length of treatment should equal out in such a

situation. This will only be true, however, if there is no systematic relationship between the inputs (such as type or number of personnel) and the complexity of treatments being provided.

The relative value schedule is one technique which attempts to get around the problems of the patient visit index. The visit in this case is weighted by the type of patient or type of visit and whether it is a new patient or follow-up visit. The value of a typical office visit changes depending upon the particular mix of patients or procedures during a particular period of time.

Attempting to improve upon this relative value schedule, Kovner⁹ has developed the Identifiable Medical Procedure for use by Southern California Permanente Medical Group. This system goes even further in assigning a weighted value to an office visit based not only on the health status of the patient but on the type of personnel who are involved in the visit. Thus a procedure performed by specialist would be weighted differently from one performed by the regular physician. This difference is based on the specialized information required of the specialist. In such a system, activities performed for the patient without him being present receive some recognition and value, and are included in the output measure index.

Once a particular measure or index of output has been selected, the task becomes one of identifying the productivity of a particular set of inputs. Linear and non-linear least squares methods are the most popular models employed, although such conventional statistical methods are based more on what is currently being performed rather than what should be done, generating a biased average which could be misleading. They do, however,

give some indication as to the rate of output that can be expected from a particular type or group of health personnel.¹⁰

Army Yardstick

Manpower requirements for work centers in the 48 U.S. Army Medical Department Activities are based on the staffing guide. The central concept of the staffing guide is the yardstick, a yardstick being an expression of the number of personnel required to perform a specific function.¹¹

The staffing guide provides guidance to the Manpower Requirements Branch in attempting to determine the number and kind of personnel that are required to perform the functions at a specific work center. Although it is used to determine personnel needs, it can just as well be interpreted from the other perspective. The guide also indicates how much productivity can be expected from that number and mix of personnel. The unit of production, in this case, is the performance factor for that center for which the yardstick has been established. The yardstick is established by historical data, statistical analysis techniques (correlation), and judgment of on-site manpower survey teams.

A yardstick based on the work unit is the most widely used, and relates manpower requirements to a number of work units in some pattern of relationship (correlation) between the work performed and the personnel assigned. The work unit is supposed to have some direct relationship to the output of work performed, for example: pages typed, bassinets occupied, or clinic visits. In a few cases the work unit is made up of more than one item, such as the Medical Care Composite Unit (MCCU) which consists of a weighted value of clinic visits, beds occupied, bassinets and admissions. For a

specific discussion of how a yardstick is developed, refer to Staffing Guide Development.¹²

Alternative Measures

The work unit for Occupational Therapy in the Army, as for most clinics, is the unweighted clinic visit. Appendix A contains the current yardstick. The Air Force uses a somewhat different methodology, the engineered standard, to identify potential workload factors which are then tested against five regression equations. This method allows for consideration of a number of factors as outputs and the standard equation arrived at allows for weighted workload factors which predict manhour requirements.¹³ Although, for Occupational Therapy, the straight line regression equation of $Y = a + bx$, with patient days as the work unit, is used, other regression models, including a multivariate can be considered. Appendix B contains the Air Force Manpower Standard.

Even within the Army Medical Department, the concept of weighted workload factors is spreading. The DENTAC has expanded from the clinic visit count to one which counts procedures performed, as well as patients treated. The procedures performed are then weighted with a value factor which seems to have some relationship to the time and difficulty of the procedure. At present a total of 49 different procedures are being counted.¹⁴

The Nutrition Clinic has recently changed its yardstick to a weighted value clinic visit equivalent. The visits are weighted as follows:
Initial visit by an individual = 1.0; Initial visit by an individual in a group session = .4; each followup visit = .2; each class or program

given = 1.5. Telephonic counseling or work performed without the patient present is not included in the count.¹⁵

The Radiology Department is also looking into a weighted reporting system which is based on a time range for specified procedures.¹⁶ Rather than having a weighted value per procedure, they tested grouped procedures according to a time range and assigned a value index to a group. This system requires a rather extensive list of procedures and definitions. The timed sequence does, however, consider all the functions performed before and after the patient is in the X-ray room.

One of the more sophisticated productivity measurement systems is the Computer Assisted Program (CAP) for workload reporting developed by the College of American Pathologists which the Army has accepted. The system is, again, based on time studies for procedures and converts these procedures through the use of unit values into workload in minutes. By also collecting manhours worked, the system can provide continuously updated productivity data and comparisons with other laboratories of similar size.¹⁷

As can be seen from the above, a variety of methods have been developed to identify what and how much the health care worker produces or should produce in any given time period. The standard clinic visit is apparently not very functional for a number of Army clinics. A recent Health Services Command Bulletin indicated that a study is being initiated "to determine an appropriate weighted value for each outpatient visit which will reasonably reflect the time, manpower, and other resources required to accomplish the required care."¹⁸

Problem Solving Methodology

The Occupational Therapy evaluation and treatment process was explored to identify potential inputs into a weighted value measure. Once the potential work units had been identified, they were incorporated into a data collection form. A short pilot test was conducted at one hospital to insure the terminology was clearly worded and did not require an inordinate amount of time to complete.

Data were collected from the 18 Occupational Therapy Clinics under Health Services Command during the month of March. Additional data of a more general nature was obtained from Health Services Command. Data were analyzed to identify different work units, or different weighted values which most closely reflected the manhours that generated them. Analysis was of the multiple regression, least-squares type. The basis for considering alternatives was a more desirable degree of correlation when compared with the present clinic visit, ease of recording data for the selected work units, and a value judgement as to how well the work units reflect the overall type of work performed by Occupational Therapy personnel.

Footnotes

¹Occupational Therapy Yardstick Task Force Committee, unpublished survey conducted in March 1978.

²John Rafferty, Health Manpower and Productivity: The Literature and Required Future Research (Massachusetts: Lexington Books, 1974), p. 144.

³Michael Averbuch, "Problems Associated with Measurement of Physician Productivity in an Ambulatory Care Setting," U.S. Army-Baylor University Bulletin of Continuing Graduate Education, (Spring and Summer 1977), p. 45.

⁴Curtis P. McLaughlin, "Productivity and Human Services," in Health Care Management Review, 1 (Fall 1976): 47-60.

⁵Jerry Cromwell, "Hospital Productivity Trends in Short-Term General Non-Teaching Hospitals" in Inquiry, XI (September 1974): 181-187.

⁶Richard M. Bailey, "Philosophy, Faith, Fact and Fiction in the Production of Medical Services," in Inquiry, 7 (March 1970): 47-49.

⁷Robert S. Daniels, "Physician Productivity and the Hospital," Inquiry, 6 (September 1969): 72.

⁸Uwe E. Reinhardt, "Manpower Substitution and Productivity in Medical Practice: Review of Research," in Health Services Research, 8 (Fall 1973): 210.

⁹Joel W. Kovner, "Measurement of Outpatient Office Visit Services," in Health Services Research, 4 (Summer 1969): 112-127.

¹⁰Uwe E. Reinhardt, p. 205.

¹¹Deputy Chief of Staff for Personnel, Staffing Guide Development, HQ, DA: Utilization and Standards Branch, Authorizations Division; Plans, Programs, and Budget Directorate, March 1975.

¹²Ibid, p. 7-21.

¹³Statistical Standards Proposal Air Force Manpower Standards, Medical Functions, prepared by Air Training Command Management Engineering Detachment, Keesler Air Force Base, 1975, pp. 1-10

¹⁴AR 40-184, "Dental Services Report," Washington, D.C.: HQ, DA (1 December 1978).

¹⁵DA PAM 570-557, "Staffing Guide for U.S. Army Medical Department Activities, Washington, D.C.: HQ, DA (June 1974, through Change 4), Table 557-153.

¹⁶HSC Letter: Weighted Radiology Workload Reporting System, RCS: HSOP-68(OT), Fort Sam Houston: HQ, U.S. Army Health Services Command (1 March 1978)

¹⁷Laboratory Management and Planning Committee, Laboratory Workload Recording Method, 4th Edition, College of American Pathologists, 1977.

¹⁸CG, HSC Bulletin No. 12-77, "Commander's Notes," Fort Sam Houston, Texas: HQ, U.S. Army Health Services Command (December 1977), p. 9.

II. WORKLOAD IDENTIFICATION

Alternatives

Logic dictates that the productivity measure which utilizes time as one of the weight factors will be the most accurate reflector of work accomplished. The Pathology workload reporting system and the proposed Radiology system described above would seem to be the most desirable method to accomplish the task. Unfortunately, the practice of Occupational Therapy does not lend itself to strict time measurements. Patients with the same diagnosis often exhibit varied symptoms which require different time elements to accomplish the same treatment task. For example, teaching a hemiplegic patient to put on a shirt one-handed could take from five minutes to thirty minutes or longer. Engineered time studies would be meaningless.

The next alternative is the weighted value procedures method used by DENTAC. By identifying all the treatment procedures possible and assigning a weighted value to these, the time aspect is incorporated without requiring actual time measurement. It is assumed that the weighted value is an average time factor. The problem with this technique for Occupational Therapy is the question of completeness and changing practice. *Problem exists with any dynamic area!* Recording procedures is meaningless unless all procedures can be included. Treatment procedures are difficult to identify and delineate because of

the tremendous variety of diagnoses that are referred and the great variety in disabilities among patients. Although some standardization of procedures and tests has been accomplished, there is still a considerable amount of treatment time which is unique for that patient.

The third alternative is some form of a weighted value equivalent to the clinic visit or even a multivariate format. The MCCU and the Nutrition Clinic visit equivalent described above are two examples of the weighted value equivalent. The Air Force uses a somewhat more sophisticated formula in their regression equation. For example, their Physical Therapy staffing equation is the multivariate linear one of $Y = 39.84 + .4435X_1 + .3018X_2 + .07169X_3$, where X_1 = Inpatient Visits; X_2 = Outpatient and Quarters Patient Visits; and X_3 = Treatments and Diagnostic Tests.¹

In attempting to establish a standardized system of charges for Occupational Therapy services, civilian therapists have explored the relative value equivalent method. The State of Washington utilizes such a system which breaks services down into some rather general assessment and procedure areas with assigned values per 15 minutes of treatment time. Appendix C contains the Washington State Hospital Commission charge system, which is one such weighted value procedure.

Responding to similar pressures to develop a uniform reporting system, the American Occupational Therapy Association Task Force approached the problem through identification of Occupational Therapy Services, primarily in the areas of Assessment, Treatment and Consultation. Their recommendation also selected the Relative Value Method, using a limited number of procedures within general categories in such a way that cost differences would be adequately covered.²

Workload Factors

Based on the alternatives described above, it was decided to explore some form of the weighted value method and compare it against the present straight clinic visit measure. ^{what are the alternatives?} Since ease of recording or gathering data was one of the criteria, it was decided to restrict the categories to some of the more general procedures which could have a time factor impact.

The need to charge for services is not a consideration in an Army clinic and it was felt that a degree of specificity ^{how much?} could be sacrificed in favor of ease of recording. Because any weighted value is always a general average reflection of the time factor, rather than a specific time measure, the approach by category should reflect this average time. Appendix D indicates the type of data that was requested.

Since some form of assessment is performed on every patient before treatment can be initiated, this category was separated from the treatment ^{from what?} category. Assessment requires problem identification and a greater amount of initial documentation and should have associated with it a somewhat greater time factor.

The treatment category is separated by the potential amount of time a therapist must spend with the patient. A "one-to-one" patient indicates the therapist must spend the entire treatment time with that patient and is unable to accomplish any other task. With a "multiple" patient, however, the therapist may work with another patient in the clinic at the same time. If none is scheduled, administrative duties or documentation can be performed during free moments while the patient is carrying on a treatment task. Although the group treatment requires attention for a specific

period, a number of patients can be seen at the same time. This distinction by time was used because it is generally felt that Medical Centers see a more involved type of patient requiring greater amounts of time. ^{one to one basis?} ^{one to one} The smaller hospitals have larger troop populations and keep patients for shorter times, with less serious disabilities.

The section labeled "Other Data" was included because there is a general feeling that home visits, older patients, and manufacturing of orthotic devices take a larger portion of the therapist's time than "traditional" treatment has in the past and should be reflected in manpower allocations. Because Developmental Disability treatments are not included in the current yardstick, this factor was isolated to see if it was making a significant contribution.

In addition to the data requested on the workload record, each clinic was also asked to submit data on their manpower, specifically the number of people assigned and the number and types of absences from duty. This data was converted into actual manhours devoted to work in clinic functions, ^{what about skill level you refer. need to previously?} excluding all secretarial and student manhours.

Because the clinic visit count has varied to a tremendous extent in the past, it was felt that perhaps a straight population served ^{how much is tremendous?} ^{define!} would not be an unreasonable manpower determination. For this reason, the population served for each MEDCEN and MEDDAC was obtained from the Resource Coordination and Analysis Division, Quantitative Analyses Branch, Health Services Command, to see if it would be a reasonably valid measure.

Footnotes

¹Statistical Standards Proposal, Air Force Manpower Standards, Medical Functions, prepared by Air Training Command Management Engineering Detachment, Keesler Air Force Base, 1975; Section 5231/Physical Therapy.

²Commission on Practice, American Occupational Therapy Association, Unpublished report "O.T. Uniform Reporting System Task Force Preliminary Report," October 1978.

III. ANALYSIS

Workload Data

The Occupational Therapy Workload Records were completed by all staff members and returned from all 18 CONUS Occupational Therapy Clinics. Upon initial exploration ^{W.C. reviews?} it was obvious that there was considerable variation in the workload accomplished for the number of personnel assigned. There was also some indication that not all of the data were recorded exactly as the instructions specified, primarily among the various treatment categories. In attempting to clarify some of these perceived problem areas through direct contact with the clinics, a tremendous variety in types of treatment programs was revealed. This variety could well explain ^{how much} the workload variations.

As a result of the preliminary analysis, the clinic at Fort Jackson was dropped from all but the population supported comparisons due to suspected invalid data. Clinic visit counts in this clinic incorporated a time factor, and the various group treatments counted groups rather than patients. It was also decided that the "PR Group" category was not a ^{Define!} dependable factor since some clinics double counted this factor, as instructed, while others did not. This could be easily identified and the data was converted to one "Group" treatment factor.

Of the 18 clinics polled in this survey, two have a major training mission which is reflected in their current manpower allocation via the current Schedule X document. Because of the difficulty in identifying the number of hours of staff time allocated to such training, it was decided to exclude the two, Walter Reed Army Medical Center and Brooke Army Medical Center, from further analysis. A number of other clinics are involved in some training programs, but their manpower documents do not reflect this as a major mission. It was felt that the time devoted to such training would not be significant for this study, since it affected ^{how many} a number of clinics equally. ← how was ^{we} determined.

When looking at the influence of items like age and home visits on the clinic workload it was obvious that these were not a significant factor. The largest number of home visits made was four during the month. One half of the hospitals made no home visits. This is undoubtedly due to staff shortages and does not reflect a desirable ^{basis for conclusion} treatment policy. The age factor data indicated that the majority of older patients are seen in the Medical Centers. The highest percent of such patients, based on clinic count, was at MAMC with 11%. The majority of the clinics, however, were between 0% and 5% of their total visits.

The "SID Visit" factor might have a significant impact but not all clinics see such patients. The data in this category went from 0% to 32% of the clinic load. ^{as measured by what?} Unfortunately, since 5 clinics did none of this category of treatments, the correlation for this factor alone was only .27. Since it is included in the treatment or assessment categories, this factor is incorporated in the rest of the analysis. ^{how?} Equally significant for some clinics

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could be the "Orthotic Devices" factor. In one clinic 11% of the visits resulted in the manufacture of such a device. Although this says nothing about their complexity, it does indicate use of time for which extra credit is not received in the standard clinic visit.

Before turning to the detailed analysis, one additional question can be settled. As previously discussed, the possibility of staffing clinics according to population served has been mentioned. Based on population data obtained from Health Services Command, neither the hours worked nor clinic visits ^{$r^2: 0?$} had any correlation with the population the hospitals supported. If clinics were staffed based on some population formula, some clinics would be seriously understaffed for the workload that is apparently there. The wide discrepancy can be seen between two MEDDAC clinics, one of which saw 3,000 plus clinic visits with a population of 85,000, while the other had a clinic visit count of 1,100 plus while supporting a population of 131,000. The higher ^{output} ~~load~~ was achieved with the addition of 1.4 man months of work time.

Table 1 represents the data that was used in the final analysis. The hours worked were based on the number of non-clerical personnel assigned, using the potential 176 hours for the month and subtracting identified non-productive time such as annual leave or sick leave. As in normal ^{what was significant?} Schedule X computations, TDY was not subtracted, but significant overtime was included. The hours for the clinic at Fort Riley were adjusted to reflect a physical move which resulted in closing the clinic for approximately one week. The weighted value variable (X_6) is an arbitrarily constructed figure which added weight to a number of the other variables and combined

CLINIC	Hours (Y)	Clinic Visit (X_1)	Comprehensive Evaluation (X_2)	One to One (X_3)	Multiple (X_4)	Group (X_5)	Weighted Value Visit (X_6)
Leonard Wood	328	360	11	108	238	-	196
Polk	504	512	30	125	107	-	251
Knox	584	512	5	212	56	8	237
Campbell	600	485	31	39	265	128	179
Riley	608	850	33	202	183	353	347
Dix	664	1,012	14	201	176	2	280
Ord	680	668	17	241	287	120	365
MAMC	736	889	72	158	250	361	394
Bragg	788	1,149	47	512	269	73	706
WBAMC	840	2,061	72	704	636	336	1,073
Benning	1,028	3,080	154	1,093	1,632	281	1,920
TAMC	1,146	2,755	77	1,149	956	542	1,608
DDEAMC	1,288	5,312	126	724	2,053	2,178	1,786
LAMC	1,503	2,589	124	471	1,006	634	1,063
FAMC	1,652	2,706	157	805	886	384	1,447

Table 1: Occupational Therapy Workload Data

them into one weighted visit as follows: 1.5 Evaluation, 1.0 One to One, .05 Multiple, .1 Group and .2 Consultation. A number of such combinations were attempted with this one seemingly having the highest correlation. SURPRISE!?

The analysis consisted of correlation and regression using both simple and multivariate regression statistics similar to those found in the Air Force Manpower Standards.

Clinic Visit

In evaluating the current clinic visit as an acceptable predictor of manhours worked, the straight line regression model of $Y = a + bX$ resulted in a coefficient of determination (r^2) of .6238. Using the curvilinear regression model of $Y = \frac{X}{a+bX}$, the coefficient of determination was raised to .7546. The minimum required value for the Air Force standard is .50, which would seem to indicate an acceptable if not ideal workload factor. Most such values for the coefficient of determination under the Air Force manpower requirements are over .90, indicating that the clinic visit could be improved upon. The Army standard for the coefficient of correlation (r) is .85. In the above curvilinear equation, the r would be .8686, indicating an acceptable degree of correlation.

Unfortunately, in spite of the mathematical validity of the clinic visit, additional questions require exploration. One of them is the manner that the clinic visit is counted. Because of the previously mentioned perceived inequities, it is questionable if the count in various clinics is recorded in the same way. In reviewing the latest manpower survey reports for the clinics, 10 of the reports indicated that the workload

but
any
50%
variation can
be
counted
as 100%
workload.

data was not used in computing manpower allocations. In one case the survey team stated that the yardstick was invalid since a time factor was not considered in the clinic visit. It would seem that the maintenance of a clinic visit count is an exercise in futility.

*Same team
or
survey
for all
10?*

Alternative Analysis

The analysis of data to identify a different factor or combination of factors proved to be inconclusive, substantiating the original impression that there was a tremendous variety in types of workload among the clinics. On straight line regression two factors proved to have a higher coefficient of determination (r^2) than the clinic visit: the weighted value visit (X_6) at .6333 and the comprehensive evaluation (X_2) at .7781. The comprehensive evaluation has a significantly higher correlation (r) at .8821 than the clinic visit. This factor must be rejected on logic grounds, however. Since most new patients must receive such an evaluation, this indicates the number of new patients that are brought into the clinic for a given number of staff. By itself it would not be a good measure of work accomplished.

*maybe it
would reflect
overall
work*

The straight line weighted value visit (X_6) is slightly better than the clinic visit, but the curvilinear best fit equation $Y = a + b \log (X)$ resulted in an r^2 of only .7026. The "F" test for the correlation coefficient of both types of clinic visits was significant at the .01 level.

The most promising correlations turned out to be of the multivariate linear form if judging only from the Army standard of a .85 or higher coefficient of correlation (r). The regression equation in this case was the $Y = a + bX_1 + cX_2 + \dots + dX_n$ type. Although it could be argued that not all the factors tested are mutually exclusive, they should tend to balance

out the weakness of each individual factor, as mentioned regarding X_2 above. The Air Force workload for Physical Therapy utilizes such overlapping factors and has found them to be the most ^{7. whole sample} equitable in staff allocation. Table 2 lists the various regression equations and combinations of variables that could have some potential. The student "t" test for the regression coefficients (not shown) varied from a significance level of .01 for X_2 to not significant for X_3 and X_5 .

Workload Factors	r^2	Coefficient of Correlation r	F Test of Correlation Coefficient
X_2, X_3, X_4	.7838	.88	13.294*
X_1, X_2, X_3	.7916	.89	13.926*
X_2, X_3, X_4, X_5	.8370	.91	12.834*
X_1, X_2, X_3, X_4, X_5	.8809	.94	13.32 *

*Significant at the .01 level

Table 2: Multivariate Regression

X_{10}^2

It is obvious from Table 2 that the more data that is added to the equation, the higher the correlation. This is logical since each additional factor further ^{accounts for a large amount} refines the input of treatment times into the hours worked. Even when the traditional clinic visit is combined with types of treatment provided during the visit, the result is a somewhat better correlation.

but is the addition of variables significant?

Discussion

It should be remembered that the above analysis involves data from only one month and may reflect an unusual workload which would be leveled out if six months worth of data is obtained. In spite of this shortcoming, there is sufficient indication to say that the clinic visit is not the most ideal workload factor for Occupational Therapy when used independently. A combination of factors which considers the number of people treated as well as the time for such treatments appears to be a more adequate indicator of manpower needs, or time spent

An alternative to the clinic visit is especially necessary in light of the comments made by the manpower survey teams on the manpower survey reports. It can be argued that if the count was recorded accurately, 66% of the workload data would not have been considered invalid. However, as long as people perceive that the yardstick standard penalizes the clinic which must treat the more involved patient on an individual basis, attempts will be made to counteract its effects. The clinic visit count for this study is not any different from that used for the manpower survey documents, and is undoubtedly affected by similar inaccuracies.

Selection of a combination of variables, similar to the ones described above as a work unit for staffing purposes would present a more desirable degree of correlation; ^{who?} they would continue to be relatively easy to record and analyze; and would in general better reflect the amount of work performed by clinic personnel. In addition, they would permit some flexibility in shifting emphasis from program to program. The current standard of 18 clinic visits per staff member per day forces maintenance of programs which are often non-productive and non-therapeutic. *Disadvantages - - -*

The variety of programs found in the clinics and the apparent variety in output per man hour should be further justification for a shift to some weighted value workload factor or factors. The programs provided and types of patients seen by a specific clinic are not under the control of the clinic staff. *Who has control?* More often than not, they depend upon the services available

in the community or the referral system of the in-house physicians. A hospital which has a particular specialty among its physician staff is more likely to refer those types of patients to Occupational Therapy. It is unreasonable to demand the same level of productivity from a clinic which sees all of the patients individually as from one which sees them in groups. The present clinic visit yardstick, in effect, does just that.

Then shouldn't this be used
as ~~the~~ the basis of manpower
allocation?

IV. RECOMMENDATIONS

The evaluation of the proposed alternatives has been discussed as they have been presented. Mathematically, the clinic visit is an acceptable measure but not the most ideal based on higher correlation with the input of manhours worked. A formula which considers a variety of factors appears to be more desirable.

Although the recommendation to discontinue the use of the straight clinic visit as the workload factor can be made without reservation, the recommendation of an alternative is more difficult. The mathematical analysis is inconclusive due to the low significance of many of the regression coefficients in the multivariate models. In addition, the Army yardstick determination process does not allow consideration of the multivariate format but uses simple regression in linear or curvilinear form. Some formula similar to the MCCU would need to be developed utilizing a combination of the variables described in this study.

As a step toward changing the current system, it is recommended that the Occupational Therapy Consultant to Health Services Command request clinics to maintain data on comprehensive evaluations and patients requiring one to one staff time for a several months period. In this way, staff can begin to identify what percentage of clinic visits result in longer treatment times. It is necessary to identify this aspect before the interval

Good - all research papers should conclude that further research is needed!

rate for the current yardstick can be addressed. If, as has been shown by two separate studies,¹ less than 65% of time is available for patient care, each patient is allowed 17 minutes under the current yardstick. This is not unreasonable for patients seen under the "multiple" category or screening, but is not adequate for individual treatments. Any weighted value visit must incorporate this percentage difference. ?

In addition to the above, it is also recommended that some standardization of programs and treatment policies be attempted. With the tremendous variety in types of treatment programs that became evident during the data collection phase of this study, comparing clinic visits is somewhat unreasonable. The greater the variety in types of patients, treatment programs and length of treatment time, the more general will be the workload factor. Perhaps this is one reason that the clinic visit, illogical as it may appear, still has a reasonable correlation. When ^{we} "evened out" among all the clinics, it does fairly well. Only when it is applied to the individual clinic with its specialized programs ^{now} ~~that~~ it becomes too simple or too difficult a standard to meet.

A further recommendation is that the Occupational Therapy Consultant appoint someone in an official capacity to continue investigation of a more adequate workload factor or factors for the yardstick and present recommendations for such to Manpower Requirements Branch, Force Development Division, HSOP, HQ, U.S. Army Health Services Command.

Regarding the type of workload factor that can be recommended, a combination of patients seen plus type of treatment provided is the recommended method of approach. Given the varied treatment programs, a detailed

listing of treatment procedures would be lengthy and cumbersome to use, and it is questionable if such a list can be developed. Through additional weight being placed on some of the more difficult treatment procedures, the clinic visit can be improved sufficiently to provide a more adequate yardstick.

Footnotes

¹Tali A. Conine and Diana L. Hopper, "Work Sampling: A Tool in Management," American Journal of Occupational Therapy, 32 (May-June 1978): 301-304; and Army Occupational Therapy Yardstick Task Force Committee, Unpublished Survey conducted March 1978.

APPENDIX A

ARMY STAFFING GUIDE: OCCUPATIONAL THERAPY

Table 557-52.28: Occupational Therapy

Work Performed. Evaluates patient's performance capacities and deficits; plans, implements, assesses, and documents treatment programs to improve physical and psychosocial functioning; applies occupational therapy principles in practice of preventive and health maintenance programs, remedial programs, and daily life task and vocational adjustment programs.

Yardstick		Clinic visits *	300	600	1,800	2,400
		Manpower requirement	.3	4	6	7
		Interval rate	.0033	.0017	.0017	

Military positions					Position delineation	Number of positions				Civilian positions	
Line	Duty position title	BR	MOS code	Grade						Job title	Code
1	OCC THER- APIST.	SP	3416	LTC	C	..	..	1	1	SUPV OCC THERAPIST.	GS-631
2	OCC THER- APIST.	SP	3416	MAJ / CPT	C	1	1	1	1	SUPV OCC THERAPIST.	GS-631
3	CH OCC THER- APY SP.	NC	91L40	E-6	C	..	..	..	1	OCC THERAPY ASST.	GS-636
4	OCC THERAPY SP.	..	91L20	E-5	C	1	1	2	2	OCC THERAPY ASST.	GS-636
5	CLERK TYPIST ..	..	71B20	E-4	C	..	1	1	1	CLERK TYPIST ..	GS-322
6	OCC THERAPY ASST.	..	91L20	E-4	C	1	1	1	1	OCC THERAPY ASST.	GS-636

*Occupational Therapy Clinic visits during calendar month as reported on the Medical Summary Report, MED-302. Visits include clinic, ward, physical reconditioning, work therapy, and community health care visits.

Note. Where clinic operates other than 40 hours a week or is combined with another clinic, manpower requirements will be determined by local appraisal.

APPENDIX B

AIR FORCE STAFFING GUIDE: OCCUPATIONAL THERAPY

**WORK CENTER
DESCRIPTION**
WORK CENTER TITLE/CODE

Occupational Therapy Clinic/5217

DEFINITION OF RESPONSIBILITIES
DIRECT:

1. TREATMENT PLANNING AND EVALUATION: Receive patients and conduct interviews to determine their specific activity needs; define treatment goals; and monitor and report patient responses and progress to referring physician.
2. THERAPEUTIC TREATMENT: Schedule patients for treatment; provide and instruct the basic craft modalities such as woodworking, metal working, leather working, printing, ceramics, and art; accomplish preliminary preparation of projects and cutting of project supplies; assist patients in more complex phases of work and in operation of machines, looms, or other equipment; and deliver supplies and instruct in step-by-step procedures of minor craft techniques to restricted ambulant and bed patients.
3. SPLINTS AND ADAPTED EQUIPMENT FABRICATION: Design, construct, and provide splint added resistance attachments, and temporary or permanent adapted equipment to provide best working position or to facilitate specific exercise for individual patient; and instruct patient in functional techniques and use of adapted equipment.
4. WORK THERAPY PROGRAM MANAGEMENT: Interview patients to determine needs; assign patients to appropriate work area; monitor patient work areas, serving as liaison between patients and supervisors; prepare progress notes and recommendations; and evaluate work areas suggested as appropriate for work therapy help.
5. DYSFUNCTION TESTING AND EVALUATING: Test children for developmental defects and/or personality disorder by evaluating their stages of physical, characteristic, and emotional development; and provide counseling, instruction, and guidance to parents in conducting treatments at home.
6. WARD ROUNDS: Accompany physicians on ward rounds.
7. CONSULTATION: Provide advice to physicians on occupational therapy programs.

INDIRECT:

8. SUPERVISION: Administer personnel; supervise personnel; review incoming distribution; review outgoing distribution; review reports and statistical data; develop budget estimates; inspect facilities; investigate accidents and incidents; and receive and assist visiting officials.
9. ADMINISTRATION: Type communications; process incoming and outgoing distribution; maintain unclassified correspondence files; maintain unclassified publications file; maintain stock of blank forms; maintain status charts and bulletin boards; maintain alert recall rosters; maintain time and attendance cards; and acknowledge visitors.
10. MEETINGS: Prepare for meeting and conduct or attend meetings.
11. TRAINING: Monitor training; develop training material; conduct training; receive training; and maintain consolidated training records.
12. SUPPLY: Maintain equipment accounts and obtain expendable supplies.
13. EQUIPMENT MAINTENANCE: Maintain office equipment and maintain shop equipment.

MANPOWER STANDARD

1. NO. YEAR APPROVAL DATE		2. UDL DATA CODE	
3. FUNCTION Hospital/Dispensary Services		4. SUBFUNCTION/CODE Occupational Therapy Clinic/5217	
5. WORK CENTER TITLE CODE Occupational Therapy Clinic/5217		6. TYPE	
7. CLASS OF STANDARD ENGINEERED		8. SCOPE AIR FORCE	
9. STATISTICAL		10. TYPE MILITARY	
11. COMMAND		12. CIVILIAN	
13. BASE PECULIAR			
14. APPLICABILITY STATEMENT			
<p>1. This standard applies only to those medical facilities having a separately organized and staffed occupational therapy work center.</p> <p>2. Extrapolation Limits: @144 Y Min = 2 X Max = 13,117</p>			
15. SPECIAL APPLICATION INSTRUCTIONS			
16. POLICY			
17. NORMAL HOURS OF OPERATION 8 Hours/Day		18. WORK WEEK 5 Days/Week	
19. MANHOUR AVAILABILITY FACTOR 144			
20. MANHOUR DATA SOURCE			
21. WORK SAMPLING		22. OPERATIONAL AUDIT	
23. MANPOWER FILES		24. TIME STUDY	
25. MANHOUR REPORTING		26. OTHER (Specify)	
27. STANDARD EQUATION (Manhours)			
$Y = 22.87 + .1230X$ $y = 94.81 + .1230x$			
28. WORKLOAD FACTOR IDENTIFICATION			
29. TITLE Patient Days			
30. DEFINITION Days of bed occupancy per month by all patients admitted to the medical facility.			
31. PAGE See continuation sheet			

AF Form 1110, page 2, 17C, SOURCE (Continued)

X: RCS: HAF-SGH(AR) 7109, Part 2, "Analysis of Hospital Services-Dispositions by Clinic Service," column, "BED DAYS IN THIS FACILITY," subcolumn, "ALL AGES," line, "TOTALS." The unit of count is a day of bed occupancy by a patient. Count the day of admission to bed occupancy. Do not count the day of disposition. Do not count days on leave, AWOL, in quarters, subsisting elsewhere, and in transit. Otherwise, count all days between admission and disposition.

STANDARD MANPOWER TABLE

WORK CENTER TITLE/ROOM

Occupational Therapy Clinic/5237

AIR FORCE SPECIALTY TITLE (AFS)	AFSC	MANHOURS AVAIL	WORKLOAD VALUES					
			1019					
		144	2279	3540	4802	6063	7324	8585
		GRADE	MANPOWER REQUIREMENT					
Occupational Therapist	9226	MAJ						1
Occupational Therapist	9226	CPT	1	1	1	1	1	1
Occupational Therapist	9226	LT				1	1	1
Occupational Therapy Tech	91371	MSG						
Occupational Therapy Tech	91371	TSG			1	1	1	1
Occupational Therapy Spec	91351	SSG	1	1			1	1
Occupational Therapy Spec	91351	SGT			1	1	1	2
Apr Occupatl Therapy Spec	91331	A1C	—	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
TOTALS			*2	3	4	5	6	7

AIR FORCE SPECIALTY TITLE (AFS)	AFSC	MANPOWER AVAIL	WORKLOAD VALUES					
		144	9846	11107	12368	13117*		
		GRADE	MANPOWER REQUIREMENT					
Occupational Therapist	9226	LT COL	1	1	1	1		
Occupational Therapist	9226	MAJ	1	1	1	1		
Occupational Therapist	9226	CPT	1	1	1	1		
Occupational Therapist	9226	LT	1	1	1	1		
Occupational Therapy Tech	91371	MSG		1	1	1		
Occupational Therapy Tech	91371	TSG	1	1	1	1		
Occupational Therapy Spec	91351	SSG	1	1	2	2		
Occupational Therapy Spec	91351	SGT	2	2	2	3		
Apr Occupatl Therapy Spec	91331	A1C	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>		
TOTALS			8	9	10	11		

*Extrapolation Limits

ANALYSIS AND ADJUSTMENTS

1. The 1968 standard developed for the Occupational Therapy Clinic utilized workload and manhour data from 9 input bases. A careful analysis was conducted on the data from each input base to determine if a separately organized and staffed work center existed. Factors considered were quantity of therapist, subprofessional, and administrative support manhours; measured and historical workload volumes; and work center comments. This screening process resulted in the elimination of Forbes from the standard computation. Forbes had a one man work center with an occupational therapy specialist assigned. An occupational therapist is considered a key element in this work center. Since no therapist was assigned and because of the low manhours and workload, the input data was not considered representative.

2. Analyses of measured manhours by category were conducted for the remaining 8 bases. Category manhours were divided by available workload factors and work units to develop unit time values. Unit time values for each category were arrayed by base and compared by computing the arithmetic mean and the standard deviation. All unit times greater than two standard deviations from the mean were examined to determine a reason for the deviation. Unless supporting data indicated a rationale for variance, category manhours were adjusted to reflect a unit time value no greater than two standard deviations from the mean.

3. Indirect manhours were analyzed by developing a ratio of category manhours to personnel assigned or direct manhours. Statistical constraints similar to those in paragraph 2 were applied and necessary adjustments were made on that basis.

4. The value of the workload factor for each input base used in the computation of the standard was obtained by dividing the current 12 month total reported in RCS-IR(AF)M-221, Inpatient Report of Admissions, Births, and Daily Average Beds Occupied, February 1968, line, "TOTAL PATIENTS," column, "DAYS OCCUPYING BEDS," by twelve.

SUMMARY OF MANNING STANDARD DEVELOPMENT INPUT DATA

WORK CENTER		FUNCTION CODE							
Occupational Therapy Clinic		5217							
BASE	MONTHLY ALLOWED MANHOURS	MONTHLY VALUES OF WORKLOAD FACTORS COLLECTED							
		X1	X2	X3	X4	X5	X6	X7	X8
Lakenheath	504.10	3028	610.0	1368	350.0	426.0			
Chanute	528.55	3533	349.4	856.2	100.4	754.0			
Eglin	772.09	5665	1335	3716	2055	1208			
Carswell	561.72	6012	1859	3342	35.53	1443			
Sheppard	1087.24	8903	2184	4738	3090	1449			
Wiesbaden	686.35	8076	863.0	2795	462.7	1461			
Wright-									
Patterson	1456.27	9271	1598	4730	1671	2018			
Travis	1356.62	10090	784.8	2266	1275	1866			

WORKLOAD FACTOR TITLES	
X1 = Patient Days	X5 = Orthopedic Patient Days
X2 = Occupational Therapy Clinic Patient Visits	X6 =
X3 = Occupational Therapy Treatments Accomplished	X7 =
X4 = Psychiatric Patient Days	X8 =

REMARKS

CORRELATION AND REGRESSION ANALYSIS OF ACCEPTED EQUATION

WORK CENTER Occupational Therapy Clinic		FUNCTION CODE 5217			
I ACCEPTED EQUATION					
REGRESSION MODEL SELECTED	Straight Line				
RESULTANT REGRESSION EQUATION	$Y = 29.87 + .1230X$				
WHERE: Y_c = COMPUTED MANHOURS X = Patient Days					
II STATISTICAL MEASURES OF ACCEPTED EQUATION					
MEASURE	OBTAINED VALUE	REQUIRED VALUE			
STANDARD ERROR OF THE ESTIMATE ($S_{y/x}$):	209.6269				
COEFFICIENT OF DETERMINATION (r^2):	.7406	.5000			
COEFFICIENT OF CORRELATION (r):	.8606	.7071			
STUDENT "T" TEST OF CORRELATION COEFFICIENT (t_c):	4.139	2.447			
FISHER "F" TEST OF CORRELATION COEFFICIENT (F_c):					
STUDENT "T" TEST OF REGRESSION COEFFICIENT (t_{b_n}):					
III DEVIATIONS RESULTING FROM APPLICATION OF ACCEPTED EQUATION					
BASE	MEASURED WORKLOAD (X)	MEASURED MANHOURS (Y)	COMPUTED MANHOURS (Y_c)	DEVIATION (MANHOURS)	NUMBERED DEVIATION
Lakenheath	3028	504.10	402.32	101.78	0.49
Chanute	3538	528.55	465.05	63.50	0.30
Eglin	5665	772.09	726.67	45.42	0.22
Carrawell	6012	561.72	769.35	-207.63	- 0.99
Sheppard	8905	1087.24	1125.19	- 37.95	- 0.18
Wissbaden	8076	635.35	1023.22	-336.87	- 1.61
Wright-Patterson	9271	1456.27	1170.21	286.06	1.36
Travis	10090	1356.62	1270.94	85.68	0.41
IV EXPLANATION OF DATA POINTS OUTSIDE TWO STANDARD ERRORS					
1. Numbered Deviation = $(Y - Y_c) \div S_{y/x}$					

SUMMARY OF OTHER MODELS & WORKLOAD FACTORS ANALYZED BUT NOT USED

WORK CENTER		FUNCTION CODE				
Occupational Therapy Clinic		5217				
WORKLOAD FACTOR(S)	REGRESSION MODEL	EQUATION	r ²	S _{y/x}	"t or F" TEST	PASS/FAIL RATIONALE
X ₁	Hyperbola	$Y = \frac{X}{6.731 + .0001950X}$	.6931	228.0421	t _c =3.681	Acceptable-Larger sy/x
X ₁	Power	$Y = .7435X^{.7983}$	.7014	224.9230	t _c =3.786	Acceptable-Larger sy/x
X ₁	Parabola	$Y = 891.7 - .1885X + .00002400X^2$	.8351	183.0936	F _c =12.661	Fails realistic criterion
X ₂	Straight Line	$Y = 625.6 + .2032X$	.1191	386.3163	t _c = .901	Fails r ² and t _c
X ₂	Hyperbola	$Y = \frac{X}{.2938 + .0009916X}$	.0857	393.5672	t _c = .750	Fails r ² and t _c
X ₂	Power	$Y = 92.14 X^{.3119}$	.1266	384.6747	t _c = .932	Fails r ² and t _c
X ₂	Parabola	$Y = 250.5 + .9755X - .0003053X^2$	.1845	407.1702	F _c = .566	Fails r ² and F _c
X ₂	Straight Line	$Y = 451.1 + .1376X$	.2804	349.1653	t _c = 1.529	Fails r ² and t _c
X ₃	Hyperbola	$Y = \frac{X}{1.388 + .0007498X}$	.2041	367.2083	t _c = 1.240	Fails r ² and t _c
X ₃	Power	$Y = 34.47X^{.3993}$	.2571	354.7792	t _c = 1.441	Fails r ² and t _c
X ₃	Parabola	$Y = 588.2 + .01342X + .00002159X^2$	.2826	380.2917	F _c = 1.014	Fails r ² and F _c
X ₂ + X ₃	Multivariate Linear	$Y = 413.3 - .6919X_2 + .4228X_3$	.4562	332.5113	F _c =1.271 t _c =1.760	Fails realistic criterion
X ₄ + X ₅	Multivariate Linear	$Y = 75.02 + .1208X_4 + .4947X_5$	.7841	209.4941	t _c =1.518 t _c =3.016	Fails r ² , t _c and F _c
X ₁ + X ₂	Multivariate Linear	$Y = 47.10 + .1275X_1 - .03991X_2$	.7443	228.0188	t _c not compared	Fails realistic criterion
X ₁ + X ₃	Multivariate Linear	$Y = 30.60 + .1233X_1 + .001010X_3$	.7406	229.6398	t _c = 6 F _c	Fails realistic criterion

APPENDIX C

WASHINGTON STATE HOSPITAL COMMISSION:
Accounting and Reporting Manual

WASHINGTON STATE HOSPITAL COMMISSION
ACCOUNTING AND REPORTING MANUAL

SYSTEM OF ACCOUNTS

7210 OTHER PHYSICAL MEDICINE
7211 OCCUPATIONAL THERAPY

Function

Occupational Therapy, under the supervision and planning of a registered Occupational Therapist, provides services to clients for the development, improvement, restoration, or compensation for the performance of necessary functions which have been impaired by living circumstances, congenital deficiency, illness, and/or injury.

These services include the use of evaluation, selection and use of modalities, instruction, supervision and/or consultation services; all to increase the client's ability to perform those daily tasks necessary for independent living.

Treatment, including one to one and group, is individualized to produce a significant practical improvement in an individual's level of functioning within a reasonable period of time.

Description

This cost center contains the direct expenses incurred in maintaining an occupational therapy program. Included as direct expenses are: salaries and wages, employee benefits, professional fees, supplies, purchased services, depreciation/rental/lease, other direct expenses and transfers.

Standard Unit of Measure: Relative Value Unit

Occupational Therapy Relative Value Units, as developed by the Washington Occupational Therapy Association. (Appendix F)

Data Source

The number of relative value units charged shall be maintained by the Occupational Therapy Department. The computer printouts may be set up to read number of units included with total amount of charges, and therefore also be maintained by the Fiscal Services Cost Center.

WASHINGTON STATE HOSPITAL COMMISSION
ACCOUNTING AND REPORTING MANUAL

APPENDIX F

OCCUPATIONAL THERAPY RELATIVE VALUES¹

CODE NUMBER	DESCRIPTION	UNIT VALUE PER 15 MIN.	
		INDIVIDUAL	GROUP
OCCUPATIONAL THERAPY ASSESSMENT			
98000	Consultation	2.0	
98001	Screening	2.0	
98005	Individual Functional Evaluation (within service facility)	2.0	
98006	Each added 15 minutes after 30 minutes	1.8	
98010	Individual Functional Evaluation (outside service facility)	2.5	
98015	Group Evaluation of Function		1.0
PROCEDURE			
98020	Self Care Skill Development	1.2	.6
98025	Drivers Program	1.8	
98030	Home/Community Rehabilitation Program	1.6	
98035	Environmental Adaptation	1.4	
98040	Cognitive Functions	1.4	1.0
98045	Neuromuscular Development	1.4	.8
98050	Body Mechanics/Mobilization Techniques	1.2	.5
98055	Gross Motor Activities	.8	.5
98060	Fine Motor Activities	1.2	.5
98065	Orthotic and Prosthetic Program	1.6	
98070	Assistive/Adaptive Device Program	.6	
98075	Sensory Integration Functions	1.8	1.2
98080	Psychological Functions	1.4	1.0
98085	Work Skill Performance	1.0	.5
98090	Parenting Skills Performance	1.6	1.2
98095	Social Performance	1.0	.5
98100	Supportive Activities	.5	.4
MISCELLANEOUS - SERVICE			
98105	Maintaining/Management Program Development	1.8	1.0
98110	Minimal Supervised Treatment	.6	
98115	Client Advocate Training/Instruction	1.8	
98120	Miscellaneous Occupational Therapy Service	SPECIAL CHARGE/BY REPORT	
98125	Combination Charge	1.0	.5
98130	Concurrent Charge (Percentage value of service)	75%	50%
98135	Milieu Responsibilities	.2	.2
MISCELLANEOUS - INDIRECT SERVICE			
98140	Conference	1.0	
98145	Documentation	1.0	.6

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<u>CODE NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT VALUE PER 15 MIN.</u> ²	
		<u>INDIVIDUAL</u>	<u>GROUP</u>
98150	Fabrication of Devices	1.4	
98151	Each added 15 minutes after 30 minutes	1.0	
98155	Equipment	SPECIAL CHARGE/BY REPORT	
98160	Travel Time/Mileage Expense	SPECIAL CHARGE/BY REPORT	
98165	Planning Time	1.4	.6
MISCELLANEOUS - TIME RECORD (AND/OR CHARGE)			
98170	Student Supervision	2.0	1.0
98175	Inservice Education	2.0	

¹ Developed in cooperation with the Washington Occupational Therapy Association.

² Group consists of three or more clients. (Individual one or two clients.)

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VALUE SYSTEM CODE INTERPRETATION
OCCUPATIONAL THERAPY

<u>CODE NUMBER</u>	<u>INTERPRETATION</u>
98000	<u>CONSULTATION</u> : Discussion and development of treatment needs with other professionals concerning clients that are not currently referred to Occupational Therapy. This may include but is not limited to reading charts, advising professionals about treatment needs and documentation of information.
98001	<u>SCREENING</u> : Reviewing potential client's case to determine need for evaluation and treatment. Will include discussion with professional/client advocates and at least interviewing client or the administration of screening evaluations.
98005 98006 98010	<u>INDIVIDUAL FUNCTIONAL EVALUATION</u> : Assessment of performance abilities and limitations in these areas: <ol style="list-style-type: none">1. Self Care Skills2. Cognitive-Sensory-Motor Functions<ol style="list-style-type: none">a. Cognitive functionsb. Sensory Stimuli Interruptionc. Motor functionsd. Integration abilities3. Psychological Functions4. Work Performance5. Social Performance6. Miscellaneous
98015	<u>GROUP EVALUATION OF FUNCTION</u> : Assessment of the above items listed in the Individual Evaluation which can be appropriately evaluated within a group setting of three or more clients.
98020	<u>SELF CARE SKILL DEVELOPMENT</u> : Improvement of skills or teaching compensation techniques for the performance of tasks which include feeding, swallowing, functioning of oral structure, dressing, hygiene, grooming, object manipulation, organization of daily tasks, manipulation of transactions (paying bills, purchasing items, using transportation facilities), self-ranging, adjusting to changes, ability to seek and use help, following through of tasks, daily management, methods of writing, use of communication devices, visually impaired movement learning, nutritional planning, and use of supplemental disease information.

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<u>CODE NUMBER</u>	<u>INTERPRETATION</u>
98025	<u>DRIVERS PROGRAM:</u> Includes but is not limited to actual performance in transferring into and out of vehicle, operation of vehicle, modification of equipment, assistance and arrangement of road test.
98030	<u>HOME/COMMUNITY REHABILITATION PROGRAM:</u> Time used to write up and instruct in the use of a comprehensive home program. Does not include actual home visit.
98035	<u>ENVIRONMENTAL ADAPTATION:</u> Limiting or compensation for, architectural barriers and safety hazards through the design and minor reconstruction, or advice in the construction, or mounting of, ramps, bars, handles, supports, etc.
98040	<u>COGNITIVE FUNCTIONS:</u> Includes stimulation and directions in the performance of activities such as: comprehension, concentration, problem solving, conceptualization, verbal communication, time management, association, retention, attention, perception, matching, sequencing, direction following, quality control, reality orientation, and the integration of learning.
98045	<u>NEUROMUSCULAR DEVELOPMENT:</u> Includes training in balance of power, general tolerance, coordination, head-neck-trunk control; sitting, kneeling, standing, and crawling tolerance; reciprocal movement, substitution, resistive exercise, inhibiting of abnormal reflexes, developing device tolerance, equilibrium responses, compensation techniques, muscle strengthening, basic instruction in neurophysiology in relation to movement and relaxation, functional range of motion, graduated movement training, sequenced movement patterns, normalization of tone, joint range, and stimulation to increase awareness and response.
98050	<u>BODY MECHANICS/MOBILIZATION TECHNIQUES:</u> Includes programs to train or develop ability for tasks related to transfers, bed mobility, techniques to reduce stress, protection of joints, energy conservation, safety considerations, positioning, adaptive physical motions and wheelchair control.
98055	<u>GROSS MOTOR ACTIVITIES:</u> Includes specific or general exercise programs, coordination, balance, and bilateral skills, graded resistive device programs, basic relaxation techniques, activities to improve general motor planning, muscle tone and endurance.

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CODE NUMBER	<u>INTERPRETATION</u>
98060	FINE MOTOR ACTIVITIES: Development of training in skills preparatory to functional tasks. These include but are not limited to hand function, manual dexterity, joint function, eye-hand coordination, reciprocal movement, grasp, pinch, endurance and tolerance of fine motor abilities, and use of equipment.
98065	<u>ORTHOTIC-PROSTHETIC DEVICE PROGRAM:</u> Includes fitting, development of wearing tolerance, efficiency of functions, minor modifications, training in the use of, and proper cleaning and maintenance. Does not include fabrication of device.
98070	<u>ASSISTIVE/ADAPTIVE DEVICE PROGRAM:</u> Includes modification, development of tolerance, and training in the self-care assistive equipment. Does not include fabrication.
98075	<u>SENSORY INTEGRATION FUNCTIONS:</u> Includes tasks to improve function in specific motor planning skills, concepts of body schema, accuracy, perception, discrimination, proprioception, kinesthesia, sensory status (touch, pressure, temperature), auditory response, stereognosis, posture, visual-spatial relationships, vestibular stimulation and developmental tasks.
98080	<u>PSYCHOLOGICAL FUNCTIONS:</u> Includes the development/training of tasks and skills involved in the display of emotional states and feelings, coping behaviors and defenses, self-identity and self-concept.
	<u>Coping behaviors:</u> Includes the development of ability to subliminate drives, find sources of need gratification, tolerate frustration and anxiety, experience gratification, control impulses, confront issues, set limits, test reality, modify behavior patterns, accept and give feedback, plan routines, and set realistic goals
	<u>Self Identity and Self Concept:</u> Includes perceiving self-needs, feelings, conflicts, defenses; differentiation of self-needs and expectations from those of others; identifying areas of self-competence and limitations; accepting responsibility for self; coping with success and failure; perceiving sexuality of self, having self respect; having appropriate body image; viewing self as being able to influence events.

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<u>CODE NUMBER</u>	<u>INTERPRETATION</u>
98085	<u>WORK SKILL PERFORMANCE:</u> The development of, or compensation for, work habits, workmanship, actual work skills of the student, homemaker, or employee/employer. Program includes the transferring and adapting of previous, or newly learned, skills to the available situations, development of work simplification techniques and, at times, volunteer placement.
98090	<u>PARENTING SKILLS PERFORMANCE:</u> Program includes tasks to teach developmental milestones, skills in use of age appropriate activities, methods of effective family communication, behavior, and practice in setting limits.
98095	<u>SOCIAL PERFORMANCE:</u> Includes the development or training of specific functional dyadic and/or group interaction skills and the transfer of these skills to the environment. <u>Dyadic interaction:</u> Includes relationships to peers, subordinates, and authority figures; demonstration of trust, respect, and warmth; perceiving and responding to needs and feelings of others; engaging in and sustaining interdependent relationships; and the communication of feelings. <u>Group interaction:</u> Includes performing tasks in the presence of others; sharing tasks; cooperating and competing with others; fulfilling a variety of group membership roles; exercising leadership skills; perceiving and responding to the needs of group members; ability to exercise rights as renter, patient, employee, and consumer; and the use of community resources.
98100	<u>SUPPORTIVE ACTIVITIES:</u> Includes the performance of general play and leisure time activities, such as: games, sports, hobbies, and social activities.
98105	<u>MAINTAINING/MANAGEMENT PROGRAM:</u> Includes time used to write up and instruct client in use of a program to sustain and protect existing functions. Does not include continued implementation of program.
98110	<u>MINIMAL SUPERVISED TREATMENT:</u> Situation where client is able to carry out treatment program with only periodic checks from therapist.
98115	<u>CLIENT ADVOCATE TRAINING/INSTRUCTION:</u> Time spent instructing client advocate to support, or continue to carry out, treatment program.

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<u>CODE NUMBER</u>	<u>INTERPRETATION</u>
98120	<u>MISCELLANEOUS OCCUPATIONAL THERAPY CHARGE:</u> Specific charges not included above that must be justified by a written report. If an item is commonly used, it must be assigned a category number by the Hospital Commission.
98125	<u>COMBINATION CHARGE:</u> Used when more than one category of treatment is used within a 15-minute period of time.
98130	<u>CONCURRENT CHARGE:</u> Used when two or more therapists are involved in the full length of treatment time. This charge used by the second therapist.
98135	<u>MILIEU RESPONSIBILITIES:</u> Time spent in milieu centered group activities with clients.
98140	<u>CONFERENCES:</u> Includes meetings with professionals, client advocates (family, friend, continued care agencies, etc.) to discuss needs, treatment, and discharge plans of referred clients.
98145	<u>DOCUMENTATION:</u> Includes time spent writing initial, continuing, and discharge information in the legal record. Does not include time in writing specific home programs or client advocate instructions.
98150	<u>FABRICATION OF DEVICES:</u> Includes time used to design, cut, form, make major modifications of adaptive, orthotic, and/or prosthetic equipment.
98155	<u>EQUIPMENT:</u> Cost plus overhead of specific adaptive, orthotic or prosthetic equipment prescribed and/or ordered for client. Special charge/by report.
98160	<u>TRAVEL TIME/MILEAGE EXPENSE:</u> Cost for time and transportation. Special charge/by report.
98165	<u>PLANNING TIME:</u> Time spent to prepare for specific treatment programs.
98170	<u>STUDENT TIME:</u> Not necessarily a charge but a record of time spent orienting and supervising student involvement in programs. Does not include field work students affiliating at the facility.
98175	<u>SPECIAL TRAINING/INSERVICE:</u> Includes time spent (within and outside of the service facility) informing or instructing groups (other than referred clients) in specific treatment programs or OT philosophies.
SPECIAL CHARGE/BY REPORT: Must submit a written explanation for specific amount or item charged.	

APPENDIX D

DATA COLLECTION:
Occupational Therapy Workload Record

OCCUPATIONAL THERAPY WORKLOAD RECORD

Indicate Approximate % of Patients in Following Areas:

Physical Disabilities

Mental Health

Developmental Dis/SID

MONTH/YEAR:

DUTY TITLE:

HOSPITAL:

OTR

COTA

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Pt Clinic Visits.																															
Inpatient.....																															
Outpatient.....																															

ASSESSMENT

Screening.....
 Comprehensive
 Evaluation.....
 Group
 Evaluation.....

TREATMENT

One to One.....
 Multiple.....
 Group.....
 PR Group.....
 Consultation.....
 Group Consult.....

OTHER DATA

Home Visit.....
 Age Factor.....
 Orthotic Devices.
 SID Visits.....

WEEKLY FEEDER REPORT
(Occupational Therapy Workload Record)

NAME: _____

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Patient Clinic Visits					
Inpatient					
Outpatient					
ASSESSMENT					
Screening					
Comprehensive Evaluation					
Group Evaluation					
TREATMENT					
One to One					
Multiple					
Group					
PR Group					
Consultation					
Group Consult					
OTHER					
Home Visit					
Age Factor (Over 60)					
Orthotic Devices					
SID Visits					

GUIDELINESOCCUPATIONAL THERAPY WORKLOAD RECORD
(Please read completely before filling in form)

The following provides some guidance in completing the workload record.

Patient Clinic Visits: This is the standard, current number of clinic visits that you generated on a specific day. If two or more people work with a group of patients, you must either split the count or allocate all of it to one person. It will all be averaged out in the end, so don't be concerned with how many you generate.

Inpatient; Outpatient: These two blocks should add up to your total clinic visits above.

ASSESSMENT: This section is intended to be mutually exclusive from the Treatment Section. If you mark a patient here, you do not mark him under Treatment, unless, on the same day, you also implement the treatment (more than a tour of clinic).

A patient should not be marked in more than one of the three assessment blocks.

Screening: Patients should be recorded here if you are attempting to determine need for OT evaluation and treatment. The patient must be present and administration of a screening tool or short interview would generally be required. Typically, they would involve such things as SID screening or hand screening programs.

Comprehensive Evaluation: Record a patient here when you are performing an evaluation for the purposes of responding to a consult. Such evaluation may consist of interview, specific observation, administration of data collection procedures, ADL assessment, SID Battery, etc. Such evaluation could continue for a number of sessions.

Evaluation -- Group: Record a patient here if you do evaluations for purposes of responding on a consult in a group of two or more, where one person does not have your complete and undivided attention. This is not typical but might be done in psychiatric or pediatric groups.

TREATMENT: Treatment, for this purpose, is anything after the initial assessment where problem areas have been identified and a treatment plan established.

One to One (1:1): Record a patient here if he requires your undivided attention for the majority of a typical treatment session for that day.

OT Workload Record

Multiple: Record a patient here if he is being treated individually in a treatment setting but does not require your complete attention for the treatment session. This is a patient who requires some supervision but is scheduled at the same time with one or more of your other patients.

NOTE: A patient may fluctuate between the above categories from day to day but should not be in both for the same treatment session. If you decide that a self-sufficient patient needs a formal re-evaluation or a specific test procedure requiring your complete attention, then he goes in the "one to one" category for that session.

Group Treatment: Record a patient here if you are working with three (3) or more patients in a related activity, organized by OT, such as a class, an SID group activity, a work group supervised by an OT staff (do not include the traditional therapeutic community or group therapy here).

PR Group: In addition, record here all patients (total number) you saw in the traditional PR activity or outing such as swimming, gym, bowling, etc., regardless of whether you counted them as a clinic visit. Some of these patients, possibly all of them, would have been included in the Group Treatment above.

Consultation: Include here any consultation with patient or significant other regarding his treatment, to include telephone conversations, if such consultation is documented on the patient's OT or medical record. Such consultation could be a change in home program, discussion with parents of a child, discussion with work therapy supervisor. This does not include discussions with other medical personnel about patient's treatment or progress. Be fair; don't count a parent if they are there during a child's treatment and you do not spend any additional time talking with them. If you do, count it. If you instruct a family member on care of the patient, count that here.

Pt. Group Consultation: Include here any consultation between OT staff and a patient or significant other done in a group setting such as therapeutic community, rehabilitation conference, parent group, amputee conference, group therapy, etc., whether or not such consultation is documented in the patient's record. Do not automatically count every patient present. A consultation should be more than "Hi! How are you?" Do not count ward rounds or rounds type clinics.

OTHER DATA: The following is an attempt to gather data on the unusual or special treatment categories. These patients would, of course, also appear in the above data.

Home Visit: Count the number of home visits made, even when you went with other medical personnel, for purposes of assessment or treatment. Each of these patients should also have been counted under the Assessment or Treatment category.

OT Workload Record

Age Factor: Count any patient you treated who was age 60 or older.

Orthotic Devices: Count the number of patients you provided with orthotic - prosthetic devices which required fabrication, fitting or modification by you.

SID Visits: Count the number of patients you saw that come under the accepted Developmental Disabilities/SID category.

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